



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

LH

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
| 09/255,777 | 02/23/99 | YAMAZAKI | S 0756-1936 |

MM22/0307

SIXBEY FRIEDMAN LEEDOM & FERGUSON PC
8180 GREENSBORO DRIVE
SUITE 800
MCLEAN VA 22102

EXAMINER

BOOTH, R

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 03/07/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/255,777

Applicant(s)

YAMAZAKI ET AL.

Examiner

Richard A. Booth

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☒ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) ____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17:2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☒ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 17) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other:

Art Unit: 2812

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki, U.S. Patent 4,727,044 in view of Han et al., U.S. Patent 4,599,118.

Yamazaki shows the invention substantially as claimed including crystallizing a semiconductor film 2 using, for example, an ultra high mercury lamp (see column 8, lines 55-65); forming a gate insulating film 3 on the semiconductor film; forming a gate electrode 5G on the gate insulating film; and forming source/drain regions 5S, 5D by implanting through the gate insulating film (see Figures 5A-5G and column 8, line 3 – column 9, line 22). Yamazaki lacks anticipation of forming a gate electrode with tapered edges and other more well known limitations such as using a laser for crystallization, introducing boron into the semiconductor film, the particular thickness of the semiconductor film, forming a gate electrode with tapered edges through wet etching, etc..

Han et al. discloses forming a very lightly doped p-type substrate followed by forming a gate electrode with tapered edges (see Figures 4-7 and column 3, line 66 – column 4, line 61) whereby doped regions are controlled by the shape of the tapered

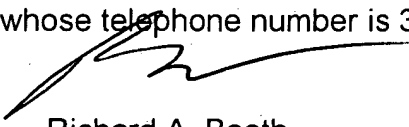
Art Unit: 2812

gate which is used to offset short channel effects. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a tapered gate with a lightly doped or substantially intrinsic channel region in the primary reference of Yamazaki because this allows for more effective tailoring of devices in order to overcome short channel effects. Regarding limitations such as the thickness, there is a tendency in the art for smaller and smaller thin film thicknesses and so the minimization of the thickness would be done through routine experimentation. Official notice is also taken with respect to performing wet etching to obtain a sloped sidewall and using a laser to perform crystallization as well as using boron to perform p-type implantations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is 308-3446. The examiner can normally be reached on Monday to Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on (703) 308-3325. The fax phone number for the organization where this application or proceeding is assigned is 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1782.



Richard A. Booth
Art Unit 2812